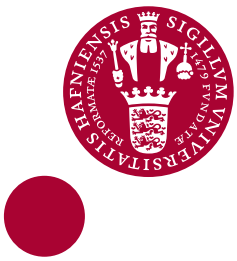


Flavour compound production by yeasts in a cheese model

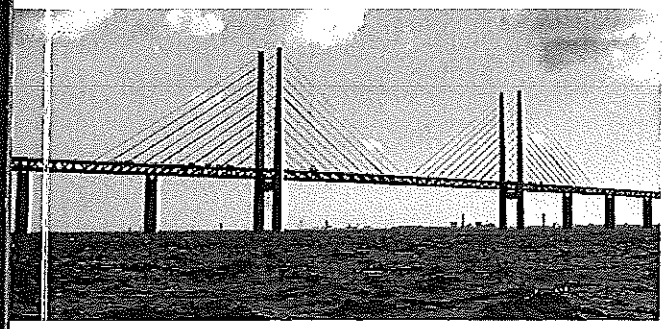
Sørensen, Louise Marie; Gori, Klaus; Petersen, Mikael Agerlin; Jespersen, Lene; Arneborg, Nils

Published in:
22nd International ICFMH Symposium Food Micro 2010

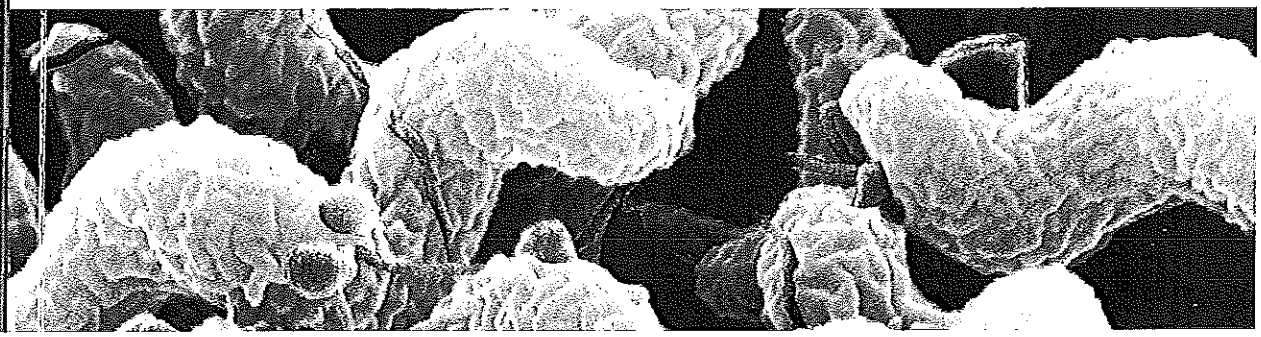
Publication date:
2010

Document version
Publisher's PDF, also known as Version of record

22nd International ICFMH Symposium Food Micro 2010



Copenhagen 30th August - 3rd September



Final Programme & Abstract Book

FOOD MICRO 2010
Microbial Behaviour in the Food Chain

www.foodmicro.dk

PEA1.09 Biogenic amines production of *Enterococci* isolated from foodstuffs

Krina Trivedi (1,2), R Karpiskova (1,2), I Borkovcova (3)
(1) University of Veterinary and Pharmaceutical Sciences Brno, Czech Republic
(2) National Institute of Public Health Prague, Brno, Czech Republic
(3) Department of Milk Hygiene and Technology, University of Veterinary and Pharmaceutical Sciences Brno, Czech Republic

Enterococci are being used as starter cultures in various European cheeses as their presence in fermented foods results in organoleptically unique products. Biogenic amines (BA), found in number of foods, are produced by microbial decarboxylation of amino acids by various bacteria including enterococci. Consumption of foods with higher amount of BA can lead to various degrees of food intolerance.The main aim of our study was to determine 3 biogenic amines produced by different *Enterococcus* species which had been isolated from various foodstuffs. In total, 350 different enterococci strains originating from the strain collection of Department of Hygiene and Milk Technology (University of Veterinary and Pharmaceutical Sciences Brno) isolated from foodstuffs and stored at -75 °C were used in this study. Three different multiplex PCR were designed for the detection of genes responsible for Tyramine, Histamine and Ornithine production. Species specific identification of enterococci was carried out using the PCR method based on the genus specific section of the *sod*A gene encoding the enzyme manganese-dependent-superoxide dismutase. Phenotypic identification for the presence of BAs was carried out by doing a modification in the Maijala's decarboxylating medium (cultivation conditions: temperature 5 °C and 20 °C for 72 hours to 6 days aerobically). The qualitative and quantitative determination of BAs was carried out by HPLC.Out of total 350 enterococci strains 200 originated from milk and dairy products, and 150 from fermented sausages and meat. *E. faecalis* (201 isolates) and *E. faecium* (87 isolates) were found to be ruling in all of the origins. Other detected species were *E. mundtii* (27 isolates), *E. casseliflavus* (19 isolates), *E. durans* (9 isolates), *E. hirae* (5 isolates), and *E. malodoratus* (5 isolates). From the genotypic (PCR) and phenotypic analysis of 350 isolates 327 (93.42 %) isolates were found to be able to produce tyramine. HPLC results showed that from the total 327 tyramine positive isolates about 272 (83.18 %) were found to produce tyramine in the range of 1000-1500mg/L, and rest 55 (16.8 %) of strains in the range of 100-500mg/L. None of the isolates were able to produce histamine and ornithine. Our results show that *Enterococcus* species are high tyramine producers.

PEA1.10 Flavour compound production by yeasts in a cheese model

LM Sørensen (1), K Gori (1), MA Petersen (1), Lene Jespersen (1), Nils Arneborg (1)
(1) University of Copenhagen, Faculty of Life Sciences, Denmark

In Denmark, there has in the past years been a development from many small farmhouse dairies towards larger, uniform and cost-efficient production units. In this process, a large part of the original microbiota has been lost as well as some of the more special cheese types and flavour notes. The aim of this work was to set-up a method for screening of yeasts for their effect on volatile compound production on a cheese substrate in order to search for potential cheese ripening-cultures to be used for new, diversified and unique cheeses. A simple cheese model based on a solid substrate containing fresh cheese and agar was used to determine the effect of surface-inoculation with either of the 3 yeast species *Debaryomyces hansenii, Yarrowia lipolytica* and *Saccharomyces cerevisiae* as well as the effect of NaCl (0 versus 3 % (w/w) NaCl in water phase) and temperature (25°C versus 12°C) on the production of volatile compounds. Volatile compounds were measured using dynamic headspace sampling followed by GC-MS and the data were assessed using multivariate analysis. The inoculated yeast species had a great influence on production of volatile compounds. Inoculation with *D. hansenii* resulted in production of the branched-chain amino acid-derived volatile compounds 2-methylpropanal, 2-methylbutanal, 3-methylbutanal, 2-methyl-1-propanol, 2-methylbutanol, 3-methylbutan-1-ol and 3-methyl-3-buten-1-ol, while *Y. lipolytica* resulted in production of the methionine-derived volatile compounds dimethyl-disulfide and dimethyl-trisulfide as well as some furanes and short-chain ketones. Production of some compounds was influenced by the temperature and addition of NaCl as for example the sulphides produced by *Y. lipolytica*, which were produced in higher amounts at 12°C and with added NaCl. *S. cerevisiae* resulted in production of the esters ethylacetat, isoamylacetat, ethylpropionat and ethylbutanoat at 25°C, but not at 12°C. Compounds as these may contribute with flavours described as malty (branched-chain aldehydes), cabbage-like (sulphides) and fruity (esters). In conclusion, the dominant yeast spp. on the cheese surface may be important for development of cheese flavour and thus the use of yeast spp. as ripening (starter) cultures have the potential to affect the flavour of cheese.

PEA1.11 The performance in Greek-style k

Marina Papadelli
E Tsakalidou (2)
(1) Technological
(2) Agricultural U

Among the Greek table olives riety, produced according to t brine. In this study, *Leuconost* olives fermentation and its pe physicochemically and microb fermentation with *Leuconost* starter the *Lactobacillus pent* three fermentations took pla the determination of pH, titra citric, succinic, tartaric) and re counting of lactic acid bacter cultures affected the pH, titra olives. The use of the starters acid production. It also shorte Complete consumption of the parameter for the avoidance c *Leuconostoc mesenteroides* s the lactic acid fermentation c

PEA1.12 The main micro

S Bolaños (1), G
(1) Universidad I
(2) Universidad A
(3) Institut de Re

Pozol is an acid, non-alcohol tamalized (cooked in a lime s banana leaves and left to fer but in many cases as the mai and moulds. Lactic acid bact of nixtamal is starch, so amy non-amylolytic lab (nalab) is comparing *rpoB* PCR-DGGE b if acidification is enhanced and highly amylolytic *Lactob* band patterns of freshly mad *coccus faecium, Weissella c Lactobacillus* species, which end of fermentation, seem t that the process to produce r and *L. plantarum* A6, compa) than *L. plantarum* A6 (μ= (in most samples suggests th and enhance acidification.